

Applicants: Gerhartz et al.
Application Serial No. 10/541,230
Amdt. dated July 20, 2006
Reply to Office Action of May 3, 2006

LISTING OF CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An electromagnetic drive device comprising a drive part arranged to be reciprocated in ~~a~~ the stroke direction and possessing a circular or oval cross section, said drive part having a permanent magnet arrangement magnetized athwart the stroke direction, such arrangement consisting essentially of two pairs ~~possessing at least one pair~~ of oppositely magnetized magnet portions arranged sequentially in the stroke direction and being arranged in the intermediate space of a yoke arrangement with pole pieces provided in the direction of magnetization on opposite sides of the drive part, wherein the yoke arrangement consists essentially of ~~possesses~~ two pairs of pole pieces delimiting the intermediate space and which are joined together by two yoke regions extending essentially in parallelism to the stroke direction, at least one of the yoke regions being surrounded by a coil able to conduct current for performing a stroke and each pair of pole pieces is provided with a pair of oppositely magnetized magnet portions of the permanent magnet arrangement, and wherein each pair of magnet portions includes an inner magnet portion and an oppositely magnetized outer magnet portion, said inner magnet portions facing one another to form a common magnetic pole in a center portion of said drive part, and said outer magnet portions forming an opposite magnetic pole at each end portion of said drive part.

2. (Previously Presented) The electromagnetic drive device as set forth in claim 1, wherein in the non-energized state of the at least one coil each pair of oppositely magnetized magnet portions is positioned in the vicinity of two pole pieces arranged on either side of the drive part.

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3. (Previously Presented) The electromagnetic drive device as set forth in claim 1, wherein the pairs of magnet portions are spaced apart by an intermediate piece in the stroke direction.

4. (Previously Presented) The electromagnetic drive device as set forth in claim 3, wherein the intermediate piece comprises non-magnetizable material.

5. (Previously Presented) The electromagnetic drive device as set forth in claim 1, wherein the width of the pole pieces and/or the diameter of the at least one coil is essentially equal to the diameter of the drive part.

6. (Previously Presented) The electromagnetic drive device as set forth in claim 1, wherein the drive part comprises a tube or round rod of non-magnetizable material, more especially plastic, which bears the magnet portions.

7. (Currently Amended) An electromagnetic drive device comprising a drive part arranged to be reciprocated in the stroke direction and possessing a circular or oval cross section, said drive part having a permanent magnet arrangement magnetized athwart the stroke direction, such arrangement possessing at least one pair of oppositely magnetized magnet portions arranged sequentially in the stroke direction and being arranged in the intermediate space of a yoke arrangement with pole pieces provided in the direction of magnetization on opposite sides of the drive part, wherein the yoke arrangement possesses two pairs of pole pieces delimiting the intermediate space and which are joined together by two yoke regions extending essentially in parallelism to the stroke direction, at least one of the yoke regions being surrounded by a coil able to conduct current for performing a stroke and each pair of pole pieces is provided with a pair of oppositely magnetized magnet portions of the permanent magnet arrangement, and wherein the drive part comprises a tube or round rod of non-magnetizable material, which bears the magnet portions, and The electromagnetic

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~~drive device as set forth in claim 6~~, wherein each magnet portion comprises two oppositely magnetized semi-circular disks or half rings.

8. (Previously Presented) The electromagnetic drive device as set forth in claim 7, wherein the magnet portions are arranged in pits or recesses in the tube or round rod.

9. (Previously Presented) The electromagnetic drive device as set forth in claim 1, wherein the drive part is connected with an output drive part which is designed in the form of a piston of a piston spool valve.

10. (Canceled)

11. (Previously Presented) The electromagnetic drive device as set forth in claim 1, wherein several yoke arrangements are arranged in tandem in the stroke direction.